Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	84	ketoisophorone	US-PGPUB; USPAT; DERWENT	OR	OFF	2005/12/02 14:47
L2	3	ketoisophorone and dehydrogenase	US-PGPUB; USPAT; DERWENT	OR	OFF	2005/12/02 14:49
L3	22	old adj yellow adj enzyme	US-PGPUB; USPAT; DERWENT	OR	OFF	2005/12/02 14:49
L4	9	l3 and cerevisiae	US-PGPUB; USPAT; DERWENT	OR	OFF	2005/12/02 14:50

L8 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:678999 CAPLUS
DN 139:213015
TI Enzymatic process for producing levodione from **ketoisophorone**
IN Shimizu, Sakayu; Wada, Masaru
PA Roche Vitamins A.-G., Switz.
SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003070959	A2	20030828	WO 2003-EP1537	20030215
	WO 2003070959	A3	20031016		
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
	RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	CA 2474802	AA	20030828	CA 2003-2474802	20030215
	EP 1476559	A2	20041117	EP 2003-742456	20030215
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	JP 2005517448	T2	20050616	JP 2003-569851	20030215
	US 2005244941	A1	20051103	US 2005-505314	20050411
PRAI	EP 2002-3968	A	20020222		
	WO 2003-EP1537	W	20030215		

OS CASREACT 139:213015

=> d ibib abs l6 1-7

L6 ANSWER 1 OF 7 MEDLINE on STN
ACCESSION NUMBER: 2004496703 MEDLINE
DOCUMENT NUMBER: PubMed ID: 15464593
TITLE: Cloning and overexpression of the old yellow enzyme gene of Candida macedoniensis, and its application to the production of a chiral compound.
AUTHOR: Kataoka Michihiko; Kotaka Atsushi; Thiwthong Rungruedee; Wada Masaru; Nakamori Shigeru; Shimizu Sakayu
CORPORATE SOURCE: Division of Applied Life Sciences, Graduate School of Agriculture, Kyoto University, Kitashirakawa-Oiwakecho, Sakyo-ku, Kyoto 606-8502, Japan.. kataoka@kais.kyoto-u.ac.jp
SOURCE: Journal of biotechnology, (2004 Oct 19) 114 (1-2) 1-9. Journal code: 8411927. ISSN: 0168-1656.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200503
ENTRY DATE: Entered STN: 20041007
Last Updated on STN: 20050309
Entered Medline: 20050308

AB The gene encoding old yellow enzyme (OYE), which catalyzes the conversion of **ketoisophorone** (KIP; 2,6,6-trimethyl-2-cyclohexen-1,4-dione) to (6R)-levodione (2,2,6-trimethylcyclohexane-1,4-dione), of Candida

macedoniensis was cloned and sequenced. A 1212bp nucleotide fragment (oye) was confirmed to be the gene encoding OYE based on the agreement of internal amino acid sequences. Oye encodes a total 403 amino acid residues, and the deduced amino acid sequence shows a high degree of similarity to those of other microbial OYE family proteins. An expression vector, pETOYE, that contains the full length of oye was constructed. Escherichia coli harboring pETOYE exhibited an about six-fold increase in specific KIP-reducing activity under the control of the T7 promoter as compared with that of C. macedoniensis. (6R)-Levodione formed with washed cells of the transformant and a cofactor regeneration system amounted to 638 mM (98.2 mg ml(-1)), the a molar yield being 96.9%. The asymmetric reduction of KIP to (6R)-levodione with E. coli cells, which co-expressed both oye and the glucose **dehydrogenase** gene (gdh), as a catalyst was investigated. The (6R)-levodione formed amounted to 627 mM (96.6 mg ml(-1)), the a molar yield being 95.4%. Since the use of E. coli BL21 (DE3) cells co-expressing oye and gdh as a catalyst is simple and does not require the addition of glucose **dehydrogenase**, it is highly advantageous for the practical synthesis of (6R)-levodione.

L6 ANSWER 2 OF 7 MEDLINE on STN
ACCESSION NUMBER: 2003085163 MEDLINE
DOCUMENT NUMBER: PubMed ID: 12596862
TITLE: Old Yellow Enzyme from Candida macedoniensis catalyzes the stereospecific reduction of the C=C bond of **ketoisophorone**.
AUTHOR: Kataoka Michihiko; Kotaka Atsushi; Hasegawa Akiko; Wada Masaru; Yoshizumi Ayumi; Nakamori Shigeru; Shimizu Sakayu
CORPORATE SOURCE: Division of Applied Life Sciences, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502, Japan.. kataoka@kais.kyoto-u.ac.jp
SOURCE: Bioscience, biotechnology, and biochemistry, (2002 Dec) 66 (12) 2651-7.
Journal code: 9205717. ISSN: 0916-8451.
PUB. COUNTRY: Japan
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200308
ENTRY DATE: Entered STN: 20030225
Last Updated on STN: 20030813
Entered Medline: 20030812
AB Microorganisms were screened for ones that reduced 3,5,5-trimethyl-2-cyclohexene-1,4-dione (**ketoisophorone**; KIP), and several strains were found to produce (6R)-2,2,6-trimethylcyclohexane-1,4-dione (levodione). The enzyme catalyzing the reduction of the C=C bond of KIP to yield (6R)-levodione was isolated from Candida macedoniensis AKU4588. The results of primary structural analysis and its enzymatic properties suggested that the enzyme might be an Old Yellow Enzyme family protein.

L6 ANSWER 3 OF 7 BIOSIS COPYRIGHT (c) 2005 The Thomson Corporation on STN
ACCESSION NUMBER: 2005:46260 BIOSIS
DOCUMENT NUMBER: PREV200500045568
TITLE: Cloning and overexpression of the old yellow enzyme gene of Candida macedoniensis, and its application to the production of a chiral compound.
AUTHOR(S): Kataoka, Michihiko [Reprint Author]; Kotaka, Atsushi; Thiwthong, Rungruedee; Wada, Masaru; Nakamori, Shigeru; Shimizu, Sakayu
CORPORATE SOURCE: Div Appl Life SciGrad Sch AgrSakyo Ku, Kyoto Univ, Kyoto, 6068502, Japan
kataoka@kais.kyoto-u.ac.jp
SOURCE: Journal of Biotechnology, (October 19 2004) Vol. 114, No. 1-2, pp. 1-9. print.
ISSN: 0168-1656 (ISSN print).

DOCUMENT TYPE: Article
LANGUAGE: English
ENTRY DATE: Entered STN: 26 Jan 2005
Last Updated on STN: 26 Jan 2005

AB The gene encoding old yellow enzyme (OYE), which catalyzes the conversion of **ketoisophorone** (KIP; 2,6,6-trimethyl-2cyclohexen-1,4-dione) to (6R)-levodione (2,2,6-trimethylcyclohexane-1,4-dione), of Candida macedoniensis was cloned and sequenced. A 1212 bp nucleotide fragment (oye) was confirmed to be the gene encoding OYE based on the agreement of internal amino acid sequences. Oye encodes a total 403 amino acid residues, and the deduced amino acid sequence shows a high degree of similarity to those of other microbial OYE family proteins. An expression vector, pETOYE, that contains the full length of oye was constructed. Escherichia coli harboring pETOYE exhibited an about six-fold increase in specific KIP-reducing activity under the control of the T7 promoter as compared with that of C macedoniensis. (6R)-Levodione formed with washed cells of the transformant and a cofactor regeneration system amounted to 638 mM (98.2 mg ml-1), the a molar yield being 96.9%. The asymmetric reduction of KIP to (6R)-levodione with E. coli cells, which co-expressed both oye and the glucose **dehydrogenase** gene (gdh), as a catalyst was investigated. The (6R)-levodione formed amounted to 627 mM (96.6 mg ml-1), the a molar yield being 95.4%. Since the use of E. coli BL21 (DE3) cells co-expressing oye and gdh as a catalyst is simple and does not require the addition of glucose **dehydrogenase**, it is highly advantageous for the practical synthesis of (6R)-levodione.

L6 ANSWER 4 OF 7 CAPLUS
ACCESSION NUMBER: 2004:819510 CAPLUS
DOCUMENT NUMBER: 142:92286
TITLE: Cloning and overexpression of the old yellow enzyme gene of Candida macedoniensis, and its application to the production of a chiral compound
AUTHOR(S): Kataoka, Michihiko; Kotaka, Atsushi; Thiwthong, Rungruedee; Wada, Masaru; Nakamori, Shigeru; Shimizu, Sakayu
CORPORATE SOURCE: Graduate School of Agriculture, Division of Applied Life Sciences, Kyoto University, Sakyo-ku, Kyoto, 606-8502, Japan
SOURCE: Journal of Biotechnology (2004), 114(1-2), 1-9
CODEN: JBITD4; ISSN: 0168-1656
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The gene encoding old yellow enzyme (OYE), which catalyzes the conversion of **ketoisophorone** (KIP; 2,6,6-trimethyl-2-cyclohexen-1,4-dione) to (6R)-levodione (2,2,6-trimethylcyclohexane-1,4-dione), of Candida macedoniensis was cloned and sequenced. A 1212 bp nucleotide fragment (oye) was confirmed to be the gene encoding OYE based on the agreement of internal amino acid sequences. Oye encodes a total 403 amino acid residues, and the deduced amino acid sequence shows a high degree of similarity to those of other microbial OYE family proteins. An expression vector, pETOYE, that contains the full length of oye was constructed. Escherichia coli harboring pETOYE exhibited an about six-fold increase in specific KIP-reducing activity under the control of the T7 promoter as compared with that of C. macedoniensis. (6R)-Levodione formed with washed cells of the transformant and a cofactor regeneration system amounted to 638 mM (98.2 mg ml-1), the a molar yield being 96.9%. The asym. reduction of KIP to (6R)-levodione with E. coli cells, which co-expressed both oye and the glucose **dehydrogenase** gene (gdh), as a catalyst was investigated. The (6R)-levodione formed amounted to 627 mM (96.6 mg ml-1), the a molar yield being 95.4%. Since the use of E. coli BL21 (DE3) cells co-expressing oye and gdh as a catalyst is simple and does not require the addition of glucose **dehydrogenase**, it is highly

advantageous for the practical synthesis of (6R)-levodione.
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L6 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2005 ACS on STN
ACCESSION NUMBER: 2003:678999 CAPLUS
DOCUMENT NUMBER: 139:213015
TITLE: Enzymatic process for producing levodione from **ketoisophorone**
INVENTOR(S): Shimizu, Sakayu; Wada, Masaru
PATENT ASSIGNEE(S): Roche Vitamins A.-G., Switz.
SOURCE: PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003070959	A2	20030828	WO 2003-EP1537	20030215
WO 2003070959	A3	20031016		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2474802	AA	20030828	CA 2003-2474802	20030215
EP 1476559	A2	20041117	EP 2003-742456	20030215
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
JP 2005517448	T2	20050616	JP 2003-569851	20030215
US 2005244941	A1	20051103	US 2005-505314	20050411
PRIORITY APPLN. INFO.:			EP 2002-3968 A	20020222
			WO 2003-EP1537 W	20030215

OTHER SOURCE(S): CASREACT 139:213015
AB An enone reductase characterized by a mol. mass of 61,300 ± 5,000 Da; NADPH and NADH as co-factor; a temperature optimum of 55-60°C at pH 7.4; a pH optimum of 4.5-8.5 and a substrate specificity on α,β-unsatd. ketones, especially derived from a yeast and a process for the preparation of levodione from **ketoisophorone**. Thus, NADH **dehydrogenase** from Saccharomyces cerevisiae were identified from genomic DNA using primers for the genes oye2 and oye3. The oye2 or the oye3 gene was then cloned into Escherichia coli JM109 using the pKK223-3 plasmid. Cells were grown, induced with IPTG and harvested by centrifugation. The harvested cells were lysed by sonication and the supernatant recovered. This cell free extract was then used to reduce **ketoisophorone** to levodione.

L6 ANSWER 6 OF 7 LIFESCI COPYRIGHT 2005 CSA on STN
ACCESSION NUMBER: 2005:15234 LIFESCI
TITLE: Cloning and overexpression of the old yellow enzyme gene of Candida macedoniensis, and its application to the production of a chiral compound
AUTHOR: Kataoka, M.; Kotaka, A.; Thiwthong, R.; Wada, M.; Nakamori, S.; Shimizu, S.
CORPORATE SOURCE: Division of Applied Life Sciences, Graduate School of Agriculture, Kyoto University, Kitashirakawa-Oiwakecho, Sakyo-ku, Kyoto 606-8502, Japan; E-mail:

kataoka@kais.kyoto-u.ac.jp
SOURCE: Journal of Biotechnology [J. Biotechnol.], (20041000) vol. 114, no. 1-2, pp. 1-9.
ISSN: 0168-1656.
DOCUMENT TYPE: Journal
FILE SEGMENT: W2; K
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The gene encoding old yellow enzyme (OYE), which catalyzes the conversion of **ketoisophorone** (KIP; 2, 6, 6-trimethyl-2-cyclohexen-1, 4-dione) to (6R)- levodione (2, 2, 6-trimethylcyclohexane-1, 4-dione), of Candida macedoniensis was cloned and sequenced. A 1212 bp nucleotide fragment (oye) was confirmed to be the gene encoding OYE based on the agreement of internal amino acid sequences. Oye encodes a total 403 amino acid residues, and the deduced amino acid sequence shows a high degree of similarity to those of other microbial OYE family proteins. An expression vector, pETOYE, that contains the full length of oye was constructed. Escherichia coli harboring pETOYE exhibited an about six-fold increase in specific KIP-reducing activity under the control of the T7 promoter as compared with that of C. macedoniensis. (6R)-Levodione formed with washed cells of the transformant and a cofactor regeneration system amounted to 638 mM (98.2 mg ml super(-1)), the a molar yield being 96.9%. The asymmetric reduction of KIP to (6R)-levodione with E. coli cells, which co-expressed both oye and the glucose **dehydrogenase** gene (gdh), as a catalyst was investigated. The (6R)-levodione formed amounted to 627 mM (96.6 mg ml super(-1)), the a molar yield being 95.4%. Since the use of E. coli BL21 (DE3) cells co-expressing oye and gdh as a catalyst is simple and does not require the addition of glucose **dehydrogenase**, it is highly advantageous for the practical synthesis of (6R)-levodione.

L6 ANSWER 7 OF 7 EMBASE COPYRIGHT (c) 2005 Elsevier B.V. All rights reserved on STN
ACCESSION NUMBER: 2004418287 EMBASE
TITLE: Cloning and overexpression of the old yellow enzyme gene of Candida macedoniensis, and its application to the production of a chiral compound.
AUTHOR: Kataoka M.; Kotaka A.; Thiwthong R.; Wada M.; Nakamori S.; Shimizu S.
CORPORATE SOURCE: M. Kataoka, Division of Applied Life Sciences, Graduate School of Agriculture, Kyoto Univ., Kitashirakawa-O., Kyoto, Japan. kataoka@kais.kyoto-u.ac.jp
SOURCE: Journal of Biotechnology, (19 Oct 2004) Vol. 114, No. 1-2, pp. 1-9.
Refs: 28
ISSN: 0168-1656 CODEN: JBITD4
PUBLISHER IDENT.: S 0168-1656(04)00251-2
COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 004 Microbiology
LANGUAGE: English
SUMMARY LANGUAGE: English
ENTRY DATE: Entered STN: 20041018
Last Updated on STN: 20041018

AB The gene encoding old yellow enzyme (OYE), which catalyzes the conversion of **ketoisophorone** (KIP; 2,6,6-trimethyl-2-cyclohexen-1,4-dione) to (6R)-levodione (2,2,6-trimethylcyclohexane-1,4-dione), of Candida macedoniensis was cloned and sequenced. A 1212 bp nucleotide fragment (oye) was confirmed to be the gene encoding OYE based on the agreement of internal amino acid sequences. Oye encodes a total 403 amino acid residues, and the deduced amino acid sequence shows a high degree of similarity to those of other microbial OYE family proteins. An expression vector, pETOYE, that contains the full length of oye was constructed. Escherichia coli harboring pETOYE exhibited an about six-fold increase in specific KIP-reducing activity under the control of the T7 promoter as

compared with that of C. macedoniensis. (6R)-Levodione formed with washed cells of the transformant and a cofactor regeneration system amounted to 638 mM (98.2 mg ml(-1)), the a molar yield being 96.9%. The asymmetric reduction of KIP to (6R)-levodione with E. coli cells, which co-expressed both oye and the glucose **dehydrogenase** gene (gdh), as a catalyst was investigated. The (6R)-levodione formed amounted to 627 mM (96.6 mg ml(-1)), the a molar yield being 95.4%. Since the use of E. coli BL21 (DE3) cells co-expressing oye and gdh as a catalyst is simple and does not require the addition of glucose **dehydrogenase**, it is highly advantageous for the practical synthesis of (6R)-levodione.